

IN THE CLAIMS

1. (Currently amended) A method of estimating a plurality of current density parameters characterizing electrical signals that would be transferred on a signal lead of an integrated circuit, said signal lead connecting a driver cell to a load cell, said method being performed in a computer aided design (CAD) tool used to design said integrated circuit, said method comprising:

modeling said driver cell in the form of a [[trapezoid]] triangle signal and said signal lead in the form of an impedance network, ~~wherein one parallel end of said trapezoid signal is substantially short compared to other parallel end of said trapezoid signal;~~

simulating an operation of said integrated circuit by providing said [[trapezoid]] triangle signal as an input to said impedance network; and

measuring electrical signals on said impedance network to estimate said plurality of current density parameters on said signal lead;

receiving a first plurality of parameters characterizing operation of said driver cell;

computing a second plurality of parameters characterizing said triangle signal based on said first plurality of parameters; and

wherein said triangle signal contains a positive peak and a negative peak, said first plurality of parameters comprises an

average current (Javg), a root mean square current (Jrms), a positive peak level (Jpkp), and a negative peak level (Jpkn), wherein durations of a positive portion of said triangle (Ta) and a negative portion of said triangle (Tb) are computed according to the equations:

$$Ta = \lceil \{6 T Jrms^2 + (8 T Javg Jpkn)\} / (Jpkp (Jpkp + 2 Jpkn)) \rceil;$$

and

$$Tb = \lceil 2 \{6 T Jrms^2 - (4 T Javg Jpkp)\} / (Jpkn (Jpkp + 2 Jpkn)) \rceil;$$

wherein T represents periodicity.

2-4. (Cancelled)

5. (Currently amended) The method of claim [[4]] 1, wherein said impedance network comprises at least one resistor and at least one capacitor.

6. (Currently amended) A machine readable medium carrying one or more sequences of instructions for causing a system to estimate a plurality of current density parameters characterizing electrical signals that would be transferred on a signal lead of an integrated circuit, said signal lead connecting a driver cell to a load cell, wherein execution of said one or more sequences of instructions by one or more processors contained in said

system causes said one or more processors to perform the actions of:

modeling said driver cell in the form of a [[trapezoid]] triangle signal and said signal lead in the form of an impedance network, ~~wherein one parallel end of said trapezoid signal is substantially short compared to other parallel end of said trapezoid signal;~~

simulating an operation of said integrated circuit by providing said [[trapezoid]] triangle signal as an input to said impedance network; [[and]]

measuring electrical signals on said impedance network to estimate said plurality of current density parameters on said signal lead;

receiving a first plurality of parameters characterizing operation of said driver cell;

computing a second plurality of parameters characterizing said triangle signal based on said first plurality of parameters; and

wherein said triangle signal contains a positive peak and a negative peak, said first plurality of parameters comprises an average current (Javq), a root mean square current (Jrms), a positive peak level (Jpkp), and a negative peak level (Jpkn), wherein durations of a positive portion of said triangle (Ta) and a negative portion of said triangle (Tb) are computed according to the equations:

$$Ta = \lfloor \{6 T Jrms^2 + (8 T Javq Jpkn)\} / (Jpkp (Jpkp + 2$$

Jpkn)} }];

and

Tb = [2 { 6 T Jrms² - (4 T Javq Jpkn) } / {Jpkn (Jpkn + 2
Jpkn) }];

wherein T represents periodicity.

7-9. (Cancelled)

10. (Currently amended) The machine readable medium of claim
[[9]] 6, wherein said impedance network comprises at least one
resistor and at least one capacitor.

11. (Currently amended) An apparatus for estimating a
plurality of current density parameters characterizing electrical
signals that would be transferred on a signal lead of an
integrated circuit, said signal lead connecting a driver cell to
a load cell, said apparatus comprising:

means for modeling said driver cell in the form of a
[[trapezoid]] triangle signal and said signal lead in the form of
an impedance network, ~~wherein one parallel end of said trapezoid~~
~~signal is substantially short compared to other parallel end of~~
~~said trapezoid signal;~~

means for simulating an operation of said integrated circuit
by providing said [[trapezoid]] triangle signal as an input to
said impedance network; [[and]]

means for measuring electrical signals on said impedance

network to estimate said plurality of current density parameters on said signal lead;

wherein said means for modeling receives a first plurality of parameters characterizing operation of said driver cell, and computes a second plurality of parameters characterizing said triangle signal based on said first plurality of parameters; and

wherein said triangle signal contains a positive peak and a negative peak, said first plurality of parameters comprises an average current (Javq), a root mean square current (Jrms), a positive peak level (Jpkp), and a negative peak level (Jpkn), wherein durations of a positive portion of said triangle (Ta) and a negative portion of said triangle (Tb) are computed according to the equations:

$Ta = [\{ 6 T Jrms^2 + (8 T Javq Jpkn) \} / (Jpkp (Jpkp + 2 Jpkn))] / 2$

and

$Tb = [2 \{ 6 T Jrms^2 - (4 T Javq Jpkp) \} / (Jpkn (Jpkp + 2 Jpkn))] / 2$

wherein T represents periodicity.

12-14. (Cancelled)

15. (Currently amended) The apparatus of claim [[14]] 11, wherein said impedance network comprises at least one resistor and at least one capacitor.